Multiples and Factors

Name: _____

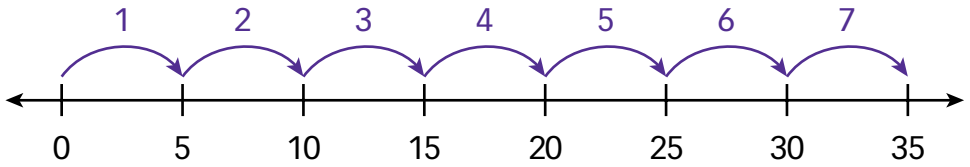
Prerequisite: Use Fact Families

Study the example showing multiplication and division facts in a fact family. Then solve problems 1–6.

Example

Write the missing number in the multiplication fact.

$5 \times \boxed{7} = 35$ 7 jumps of 5

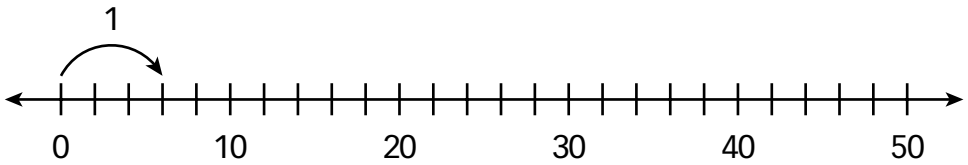


Write the multiplication and division facts in the fact family.

$5 \times \boxed{7} = 35$ $\boxed{7} \times 5 = 35$ $35 \div \boxed{7} = 5$ $35 \div 5 = \boxed{7}$

1 $6 \times \square = 48$.

a. Draw and label jumps on the number line.

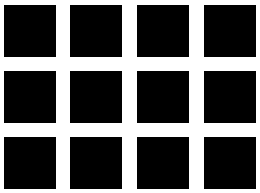


b. Write the multiplication fact. _____

c. Write the fact family.

_____ _____ _____ _____

2 Look at the array at the right.



a. Write the missing number.

$4 \times 3 = \square$

b. Write the fact family.

$4 \times 3 = \square$ _____ _____ _____

Vocabulary

multiplication an operation used to find the total number of items in equal-sized groups.

$5 \times 7 = 35$

Solve.

3 Write the multiplication and division facts for the fact family with the numbers 5, 6, and 30.

_____ _____

_____ _____

4 What two multiplication facts can you use to solve $\square \div 9 = 7$?

_____ _____

5 Look at the multiplication and division facts below. Are they a fact family? Explain.

$4 \times 6 = 24$ $24 = 3 \times 8$ $24 \div 6 = 4$ $8 = 24 \div 3$

_____

_____

_____

6 Complete each fact family. Use the numbers in the tiles below to fill in each box. You may use some tiles more than once.

36	18	12	9	6	4	3	2	1

$2 \times 9 = \square$

$\square \times 2 = \square$

$18 \div 9 = \square$

$\square \div \square = \square$

$12 = 4 \times \square$

$\square = \square \times \square$

$3 = \square \div 4$

$\square = \square \div \square$

$\square \times 6 = \square$

$\square \div \square = \square$

Name: _____

Use Multiples

Study the example showing how to use multiples to solve a word problem. Then solve problems 1–6.

Example

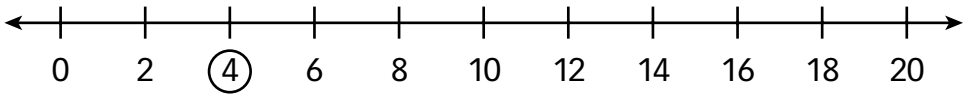
Markers come in boxes of 5. Paul needs 40 markers for students in the art club. Can Paul buy exactly 40 markers in boxes of 5? How many boxes does he need to buy?

Find multiples of 5.

$5 \times 1 = \mathbf{5}$	$5 \times 4 = \mathbf{20}$	$5 \times 7 = \mathbf{35}$
$5 \times 2 = \mathbf{10}$	$5 \times 5 = \mathbf{25}$	$5 \times 8 = \mathbf{40}$
$5 \times 3 = \mathbf{15}$	$5 \times 6 = \mathbf{30}$	$5 \times 9 = \mathbf{45}$

40 is a multiple of 5.
Paul can buy exactly 40 markers in boxes of 5.
Paul needs to buy 8 boxes.

1 Skip count by 4s to find multiples of 4. Circle the multiples on the number line.



2 Complete the multiplication facts to find more multiples of 4.

$4 \times 6 =$ ____ $4 \times$ ____ $=$ ____

$4 \times$ ____ $=$ ____ $4 \times$ ____ $=$ ____

$4 \times$ ____ $=$ ____ $4 \times$ ____ $=$ ____

3 Look at problems 1 and 2. Are these the only multiples of 4? Use words and numbers to explain.

_____

_____

_____

Vocabulary

multiple the product of a number and any other whole number, for example, 3, 6, 9, 12, and 15 are multiples of 3.

Solve.

4 Max ordered 72 mugs. Mugs are packed 8 to a box. How many boxes of mugs did Max order?

Choose *Yes* or *No* to indicate whether the equation or statement could be used to solve the problem above.

a. $72 = 8 \times b$ ☐ Yes ☐ No

b. $72 \div 8 = b$ ☐ Yes ☐ No

c. List multiples of 8: 8, 16, 24, 32, 40, ... ☐ Yes ☐ No

d. $b = 72 + 8$ ☐ Yes ☐ No

5 Cupcakes are packed 6 to a box. If Abby only buys full boxes of cupcakes, give two possible numbers of cupcakes that she could buy.

Show your work.

Solution: Abby could buy _____ cupcakes or _____ cupcakes.

6 Strawberries are sold in 1-pound, 2-pound, and 5-pound boxes. Stacy wants to buy exactly 10 pounds of strawberries. What are two ways that Stacy could buy exactly 10 pounds of strawberries? Tell which sizes of boxes she could buy and how many of each size box.

Show your work.

Solution: _____

_____

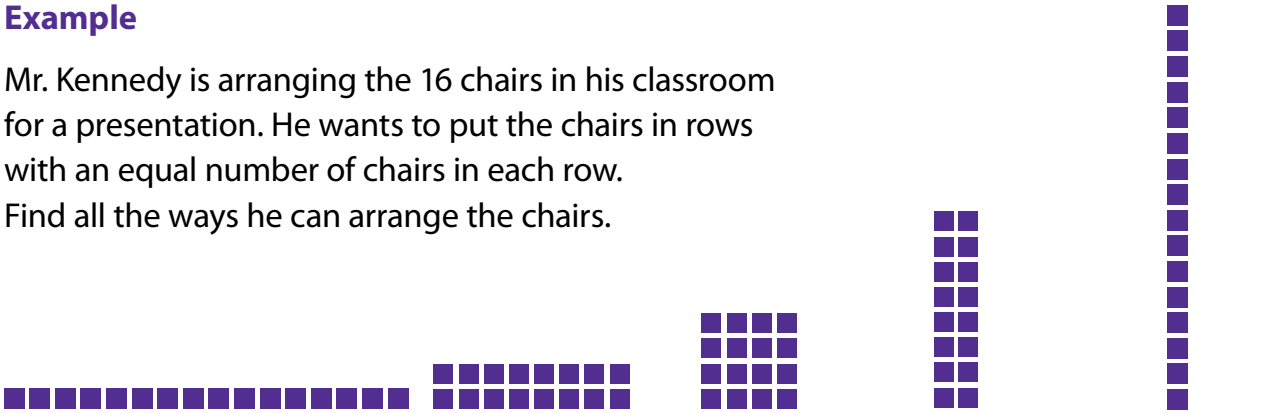
Name: _____

Find Factors and Factor Pairs

Study the example problem about factors and factor pairs. Then solve problems 1–6.

Example

Mr. Kennedy is arranging the 16 chairs in his classroom for a presentation. He wants to put the chairs in rows with an equal number of chairs in each row. Find all the ways he can arrange the chairs.



1 row of 16 chairs	2 rows of 8 chairs	4 rows of 4 chairs	8 rows of 2 chairs	16 rows of 1 chair
$1 \times 16 = 16$	$2 \times 8 = 16$	$4 \times 4 = 16$	$8 \times 2 = 16$	$16 \times 1 = 16$

Factors of 16: 1, 2, 4, 8, 16.
Factor pairs: 1 and 16, 2 and 8, 4 and 4.
Mr. Kennedy can arrange the chairs in 5 ways.

1 Complete the list to show the factors of 12.

1, _____, 3, _____, 6, _____

2 Write the factor pairs of 12.

1 and _____, _____ and _____, _____ and _____

3 The 20 students in Amanda's class each carved a wooden plate to display on the wall. They want each row to have the same number of plates. Find all the ways to display the plates.

Show your work.

Solution: _____

_____

Vocabulary

factor pair two numbers that are multiplied together to give a product.

$2 \times 4 = 8$, so 2 and 4 are a factor pair of 8.

Solve.

4 Tell whether each sentence about the factors of 18 is *True* or *False*.

a. All the factors of 18 are 2, 3, 6, 9, 18. ☐ True ☐ False

b. 1 and 18 are a factor pair. ☐ True ☐ False

c. 180 is a factor because $10 \times 18 = 180$. ☐ True ☐ False

d. An array showing the factor pair of 3 and 6 would have 3 rows of 6 objects. ☐ True ☐ False

5 Carlos arranged his building blocks into 2 rows of 12 blocks. Liz arranged her blocks into 6 rows of 4 blocks. If they each use the same number of blocks, what two other ways could they arrange their blocks?

Show your work.

Solution: _____

_____

6 Jonah has 100 flowers to arrange into vases. He wants to put the same number of flowers in each vase. List the factor pairs of 100. Then complete the table to show the different ways to arrange the flowers.

Factor pairs of 100: _____

_____

Number of vases									
Number of flowers in each vase									

Name: _____

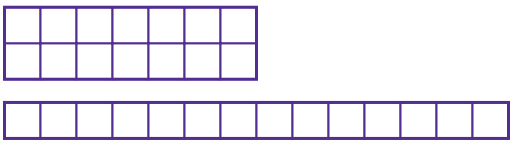
Identify Prime and Composite Numbers

Study the example showing how to identify prime and composite numbers. Then solve problems 1–6.

Example

Ms. Morris teaches a morning class with 13 students and an afternoon class with 14 students. Which class has a prime number of students?

13 has one factor pair: 1 and 13
13 is a prime number.



14 has more than one factor pair: 2 and 7, 1 and 14
14 is a composite number.

The morning class has a prime number of students.

1 Is the number 2 prime or composite? Explain.

_____

_____

2 Kevin ran 23 laps around the track. Is the number 23 prime or composite? Explain.

_____

_____

3 Mae has more than 3 bracelets. She has an even number of bracelets. Is the number of bracelets a prime number or a composite number? Explain.

_____

_____

_____

_____

_____

Vocabulary

prime number a number that has only one pair of factors: itself and 1.

5 is a prime number; its factors are 5 and 1.

composite number a number that has more than one pair of factors.

8 is a composite number; it has the factors 1, 2, 4, and 8.

Solve.

4 Tell whether each sentence is *True* or *False*.

a. The number 9 is prime. ☐ True ☐ False

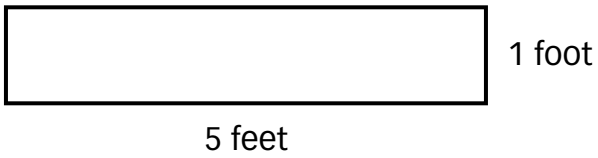
b. 2 is the only even prime number. ☐ True ☐ False

c. All the odd numbers between 1 and 10 are prime. ☐ True ☐ False

d. Some composite numbers have only two factors. ☐ True ☐ False

5 The area of a garden is 5 square feet.

The dimensions of the garden are 1 foot and 5 feet. 1 and 5 are factors of the number 5.



a. Is the number 5 a prime number? _____

b. If the area of a garden is 11 square feet, what could be the dimensions of the garden?

_____

6 Jordan and Mitchell are planning a graduation party with 45 guests. They want to seat an equal number of guests at each table. Each table should have more than one guest. Answer the questions below.

a. List the different ways the guests and tables could be arranged. Tell how many tables are needed for each group of guests.

_____

_____

b. Jordan and Mitchell forgot to include themselves in the seating. They still want to have an equal number of guests at each table. List the ways the guests and tables could be arranged now.

_____

_____

Name: _____

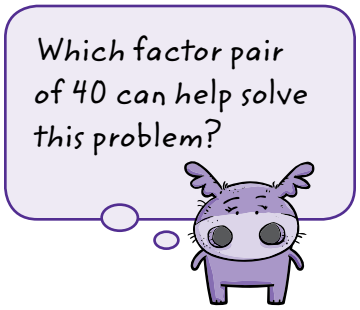
Multiples and Factors

Solve the problems.

1 Raffle tickets at a fundraiser are $5 per ticket. Fiona spent $40 on tickets. How many tickets did she buy?

Show your work.

Solution: _____



2 Which sentence(s) below are true about the numbers 1, 3, and 9?

Circle the letter for all that apply.

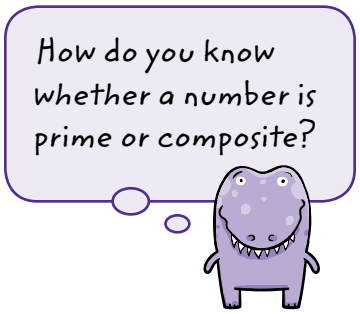
A Adding 1 to any of the numbers will make a composite number.

B Adding 2 to any of the numbers will make a prime number.

C 3 and 9 are prime numbers.

D All the numbers are factors of 9.

E All the numbers are factors of any multiple of 3.



3 The factors of 6 are also the factors of which number?

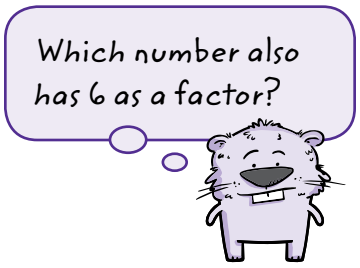
A 5 **C** 20

B 10 **D** 30

Mike chose **D** as the correct answer. How did he get that answer?

_____

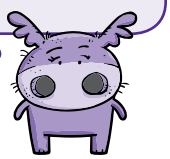
_____



Solve.

4 If n = any number, what is one factor pair that you know n has?

All numbers have 1 as a factor. What is the greatest factor any number can have?

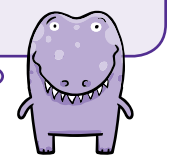


Solution: _____

_____

5 Look at each number sentence below. Tell whether the circled number is a *factor* or *multiple*.

Is the number multiplied by another number or is it a product of two numbers?



a.	$1 \times (4) = 4$	☐ factor	☐ multiple
b.	$4 \times 1 = (4)$	☐ factor	☐ multiple
c.	$(5) \times 1 = 5$	☐ factor	☐ multiple
d.	$(5) = 5 \times 1$	☐ factor	☐ multiple

6 There are 56 fourth graders going on a field trip. The teacher wants to divide them evenly into groups of at least 4 students and no more than 8 students. What are the ways to divide the students evenly into groups?

Show your work.

How can you use the factor pairs of 56 to find all the possible groups?

Solution: _____